

ABSTRACT OF THE INVENTION

The present invention provides a selectively conductive organic semiconductor (e.g., polymer) device that can be utilized as a memory cell. A polymer solution including a conducting polymer self assembles relative to a conductive electrode. The process affords self-assembly such that a shortest conductive path can be achieved. The method includes depositing a concentrated solution of conducting polymer on a conductive surface, applying heat and optionally a vacuum, and permitting the conducting polymer to self-assemble into an organic semiconductor. The organic semiconductor can be employed within single and multi-cell memory devices by forming a structure with two or more electrodes while employing the organic semiconductor along with a passive device between the electrodes. A partitioning component can be integrated with the memory device to facilitate programming and stacking of additional memory cells on top of or in association with previously formed cells.